Remarks

Claim Rejections - 35 USC § 112

Claims 10 and 11 were rejected under section 112, second paragraph, In claim 10, line 1, the claimed "claim 9 is clear" is ambiguous. Claim 11 was similarly rejected.

Claims 10 and 11 have been responsively amended.

Claim Rejections - 35 USC § 103

Claims 1 - 3, 6 - 12, 17 - 20, 23 - 30, and 35 were rejected as being obvious over **Monroe**, U.S. Patent Application 2003/0067542.

In regard to claim 1 The Examiner contended that **Monroe** discloses an apparatus for a communication network in which each object includes a location circuit (paras. [109], [0115]); a means for receiving location information, activating responsive function, storing events, and automatically activates selected functions controlling the first object in response to the location of the second object (para [0086]- 0088]; [0091]; [0095]; [0115]); a communication circuit (para [0109]). The Examiner admitted that **Monroe** does not explicitly teach using a processor as a means for receiving, communicating and activating responsive function. However, the Examiner contended that **Monroe** teaches that the first object is capable of performing the claimed function (para [0086]- 0088]; [0091]; [0095]; [0115]). Further, the Examiner contended that implementing a controller for controlling data processing, data analysis and data

transmission would have been well known. The Examiner contended that it would have been obvious to use a well known controller for performing the analyzing position data, storing the data, and communicating data since selecting a known processor that is known to be able to perform the function of **Monroe** requires only routine skill in the art.

What is not shown, implicitly or explicitly, in **Monroe** is the combination of two interacting objects themselves. In **Monroe** the communication is always between an object (an aircraft or other moving objects) and a fixed control center where actions are taken at the fixed control center and the message or instruction is then sent to the object for response. In the present invention, Claim 1 (13 – 15), the first fixed or moving object can respond to the location of the second fixed or moving object and take necessary actions automatically, without the need to go through a dispatch center or a control center, and without the need of any person at the control center to issue actions. The network may be established between the objects themselves without a server or control center. To the extent that this point was not clear in the original form of claim 1, it has been broadened by amendment to explicitly include this construction. The practical and operational significance of this difference is substantial.

Claim 1 is directed to an apparatus for communication to a network and for use with at least a first and second object. A location circuit and processor provided in each object communicates with another object and activates responsive functions according to the corresponding object's current location. A communication circuit in the same object communicates with the network. *The*

processor corresponding to the first object automatically activates selected functions controlling the first object in response to the location of the second object. In other words, the objects themselves control the responses taken in regard to each other and this control decision is not always made in the network server.

In regard to claims 2 and 3, the Examiner contended that including a satellite and GPS receiver, communicating from a mobile device to a terrestrial location detection network would have been well known.

Applicant's amended Claim 2 differs from existing GPS devices in that it may receive GPS signals from only one satellite, rather than at least four out of the constellation of 24 GPS satellites. The thrust of claim 2 is the combination of a GPS satellite and some terrestrial location detection system. None of the prior art has a combination of GPS satellite and terrestrial location system. All of what has been known in GPS or terrestrial location systems consists of either GPS satellites (at least four satellites) or terrestrial location detection such as RF triangulation, exclusively. It is only in the present invention that a combination of GPS and terrestrial using just one GPS satellite signal is made available for the first time. To facilitate this, the location circuit communicates with a terrestrial location detection network as claimed in Claim 3.

In regard to claims 6 - 11, the Examiner contended that **Monroe** teaches storing the location, time, of an object for an event (para [0084]). Further, the Examiner contended that storing speed, direction of an object, messages send or receive, erasing a message from a memory according to a predetermined criteria

would have been known. Further, the Examiner contended that choosing information that is of interest to an operator to store and choosing to reserve or delete a message from memory as prefer to a designer requires only routine skill in the art.

Paragraph 84 of **Monroe** relates to taking an inventory of a plurality of assets or objects. **Monroe** has nothing to do with an event in which the object may be involved or potentially involved, but only whether the asset is present or not within a zone. Insofar as **Monroe** is concerned the object is the only object in existence and is not therefore involved in any event of any kind. Paragraph 84 of **Monroe** states:

> "[0084] The following table illustrates a typical asset status poll and table for monitoring a plurality of assets such as those shown in FIG. 6 to determine the location, last time polled, and status of each asset, including personnel, support and response vehicles and commercial transports in the supervised zones."

In contrast to **Monroe**, what the present invention teaches is to also include all the events taken at the object, and the processing of the event information in the memory and storage of such event information. The additional piece of information about an event is important in this embodiment of the invention making it different from other existing systems. An example will serve to illustrate the point. One illustrative example of such an event is when a fire engine installed with the invention runs through a red light in an emergency situation, and at the same time as a police patrol vehicle installed with the invention yields at the intersection "automatically" due to an "event instruction". In this example, both vehicles are moving objects and both take actions

automatically in response to the event of the potential collision of two the objects, namely the police car and the fire engine both responding to emergencies. The storing and processing of the event information is clearly important for assessing the handling of the situation where such priority decisions are to be made or decisions dependent on the nature of the event and the relationship of the objects. **Monroe** does not handle an "event" in this sense, but it only deals with messages. Claim 6 relates to storing event information for which **Monroe** has no utility. Claim 7 relates to storing type of event data for which **Monroe** has no utility. Claim 8 relates to the storing of event data correlated to messages for which **Monroe** has no utility. Claims 9 – 11 relate to the communication and storing protocols for event data for which **Monroe** has no utility.

In regard to claim 17, the Examiner contended that implementing a plurality of input/output ports to interface with a plurality of external devic3es would have been known.

Implementing a plurality of both input and output ports to interface with a plurality of systems is standard for computers, but has not been done with moving objects with a location detection device. The existing implementations of location detection devices have only one input port for location, either a GPS antenna or an RF antenna for terrestrial location networks. The existing implementations of location devices have only one output port to send out location information. The claimed embodiment requires multiple ports of input in order to receive location information from GPS satellites and terrestrial location networks simultaneously, and multiple output ports to send messages to both the

control center (server) and other moving objects simultaneously. **Monroe's** system, and other existing systems, do not need the plurality of input ports to receive the combination of GPS signals and terrestrial location signals, neither do they need the plurality of output ports to report to control center and issue action instructions to other moving objects simultaneously.

In addition, claim 17 depends on claim 1 and is allowable therewith.

In regard to claims 18 - 20, 23 - 29, and 35, the Examiner referred to his positions taken in regard to claims 1 - 3, 6 - 11, and 17 above.

These claims are the method analogs of the referenced apparatus claims and are therefore distinguishable over **Monroe** for the same reasons as stated above in regard to the corresponding apparatus claim.

Claims 4, 5, 21, 22, 36, 37, 42, 43, 51 and 52 were rejected as being obvious over **Monroe** in view of **Pratt** US Patent 6,285,315.

In regard to claims 4, 21, 36, 42, and 51, the Examiner contended that **Pratt** teaches a location circuit capable of communicating with a satellite and a terrestrial location detection network in combination (col.5, lines 51-55, lines 63-67; col.6, lines 1-6). The Examiner concluded that it would have been obvious to include a means for communicating with the combination of a satellite and a terrestrial location detection network of **Pratt** to the system of **Monroe** in order to enhance accuracy in determining the location of a mobile object.

Pratt is directed to a system for enhancing the accuracy of location information from GPS satellites. Adding **Pratt** to **Monroe** will only add the

location accuracy, rather than to any functionality. **Pratt's** use of a terrestrial communication network to pass the information from GPS satellite is needed to enhance accuracy by processing the ephemeris data about GPS satellites. **Pratt's** invention became obsolete after May 1, 2000 when the U.S. Government relaxed the human introduced error (call SA) in the GPS systems. **Pratt's** invention has nothing to do with any added the functionality as claimed in the present invention. Also, the use of a terrestrial communication network in **Pratt's** system is just to pass the ephemeris data of GPS satellites from a ground station, called the Terrestrial Station in **Pratt**, to the mobile receiver. With the ephemeris data, the position calculation inside the moving object can be adjusted and the accuracy enhanced.

The main differences between **Pratt's** system and the present invention are the follows:

1. First, in **Pratt**, the source of all the location information is from GPS satellites. There is no location information generated from a terrestrial network. The Terrestrial Station in **Pratt** serves as the communication media to pass ephemeris data from GPS satellites to the moving objects, and the source is still GPS satellite. In the present invention, the terrestrial location network is totally different from a communication media, and the network generates and provides location information based on ground positions – thus the source of location information is terrestrial, not GPS satellites. Adding **Pratt's** system to **Monroe** will at most help **Monroe**

enhance GPS position calculation, and this is no longer needed in the present invention.

2. Second, **Pratt's** system uses the Terrestrial Station to disseminate the ephemeris data to moving objects. This may only affect the design of the GPS engine board that is used as given in the present invention. In the present invention, the terrestrial location network is to provide moving object the location information that is not available through GPS satellites. In other words, the present invention obtains position from multiple sources, including GPS satellites and terrestrial location networks, while **Pratt's** system uses only one single source of location information from GPS satellites.

3. Third, in the present invention, the purpose of supporting multiple terrestrial wireless communications is to pass location information and event information between a moving object and both control stations and other moving objects. This function does not exist in **Pratt's** system.

The claims have been amended to show the added functionality of providing a backup locational system and method using a terrestrial location network on the condition that the GPS system fails in some manner to provide acceptable location determination.

In regard to claims 5, 22, 37, 43, and 52, the Examiner contended that **Pratt** teaches the capability of determining the location of the mobile device using either the data from the GPS receiver or the terrestrial data (col.6, lines 16-48) depending on the accuracy required. Further, the Examiner contended that

determining location of a mobile object using terrestrial data only would have been known. The Examiner contended that it would have been obvious to use the terrestrial data when the data from the GPS receiver is not available, since using a known alternative method (using terrestrial data) for determining the location of a mobile device when the GPS signal is not available requires only routine skill in the art.

In **Pratt** the only source of location information is GPS satellites. There is no location information from the ground (terrestrial). The Terrestrial Station presented in **Pratt** is to pass the ephemeris data, which is to correct the GPS signals due to variations such as atmospheric conditions and others related to GPS satellites. In other words, ***Pratt*** *does not provide any location information from the ground source*. The terrestrial location information discussed in the present invention is from the ground, not GPS satellites. This may include a set of at least three RF towers for triangulation from the towers' positions, or from one single landmark issuing RF signals to indicate the position. In other words, Pratt does not deal with any terrestrial location information.

In the prior art, terrestrial location was based on RF triangulation. No existing system has a device to implement both a receiver of GPS satellites and a receiver of terrestrial location network. Furthermore, any existing GPS device requires at least four GPS satellites, and the ground correction of location is based on internal computation using a directional sensor (gyro) and a speed sensor. No existing publication use a combination of GPS satellites, terrestrial location network, and internal calculation as presented in the present invention.

The present invention uses one GPS satellite plus terrestrial location information, which is not found in any existing publications. A GPS receiver requires an antenna connected to the GPS engine board, and a terrestrial location detection system requires a two-way radio receiver or radio modem. Their combination requires a complicated processing which makes the present invention different from **Pratt's** system and **Monroe's** system.

Claims 13, 31, 38, and 44 were rejected as being obvious over **Monroe** in view of **Pratt** and further in view of **Rowson** et al US Patent 6,067,484.

In regard to claims 13, 31, 38, and 44, the Examiner contended that **Rowson** teaches selecting a best signal from a plurality of input sources (col. 6, lines 19-40), further, including modems for wireless communication between devices would have been well known. The Examiner contended that it would have been obvious to select the data from input sources of **Pratt** in order to ensure using appropriate signal for determining position of the mobile device of **Monroe**.

Rowson deals with differential GPS and the issue is the accuracy of GPS data. The differential GPS is designed to correct the GPS data errors (SA) intentionally introduced. Typically, one needs to have one base station with known location to receive GPS signals and compute the human introduced errors, and provide such intentional error information to a mobile unit to do the same correction, as long as that mobile unit is within a reasonably distance from the base station. That correction may not be accurate if the moving object is too far from the base station. In this regard, **Rowson** presented the idea of using

multiple base stations to correct GPS data, and use the average to reduce the inaccuracy due to the distance from one single base station. In **Rowson**, the only source of location information is GPS satellites. The multiple base stations are designed to offer a ground correction of GPS data, not any new location information. The wireless modems were used to receive the GPS correction information from the multiple base stations.

In the present invention, the source of location information includes a GPS satellite and terrestrial location networks, unlike **Rowson** that relies solely on GPS. In the present invention, the multiple wireless communications are used to communicate between the mobile unit and the control center, and other mobile units, unlike **Rowson** that uses wireless communications just to send the GPS correction data. **Rowson's** system only needs a one-way radio receiver where as the present invention requires two-way radio modems. In the present invention, the location information comes from multiple sources, including GPS and terrestrial, whereas **Rowson** relies only on GPS data.

In sum, **Rowson's** system can be incorporated into the present invention for the purpose of enhancing the accuracy of GPS data, but this incorporation does not affect all the functions presented in the present invention. Furthermore, **Rowson's** method is useless for the present invention after May 1, 2000 when the human introduced GPS errors are removed by the government.

Claim 13 for example is directed to a frequency adjustable transceiver in each object coupled to wireless modems and a satellite modem in which the transceiver is controlled to select a best signal from the wireless modems, but if

the best signal from the wireless modems fails to satisfy a predetermined threshold, then to select a signal from the satellite modem. **Rowson** is not selecting among a plurality of signals from which to take data, but selects all signals and disregards data which is deemed invalid. There is no signal selection being performed. Clearly you cannot reject data unless the data signal has been selected and received. **Rowson** states at col. 6, lines 19 - 40:

> "Both integrity monitors 28a and 28b perform identical functions, although on different sets of satellite data. Each integrity monitor 28b and 28b receives the averaged pseudorange corrections from the primary reference station 24 and one of the secondary reference receivers 26a or 26b, and, for each satellite, computes the difference between the two independently generated corrections and compares the results, for example, to a preset limit, and excludes satellites which fall outside the preset limit. . . . "
>
> "The integrity monitors 28a and 28b also receive the estimated parameters from the UDRE data determination processes (as described below) from the primary reference station 24 and one of the secondary reference receivers, 26a or 26b, and compares these values to ensure that they are within a preset limit. If any of these two comparisons indicate an out-of-bounds condition, *then that set of differential corrections and UDRE data for that particular satellite are declared invalid by the integrity monitor, 28a or 28b.*" (emphasis added)

Claims 14 - 16, 32 - 34, 48 - 50, 54 - 57, and 61 - 63 were rejected as being obvious over **Monroe** in view of **Burns et al** US Patent 5,129.605.

In regard to claim 14 - 16, and 32 - 34, the Examiner contended that **Burns** teaches using the location data from the dead reckoning when the GPS fail to provide valid location fix (col. 5, lines 14 - 17, lines 49 - 64; col. 6, lines 9-20). Further the Examiner contended that using three dimensional gyro in the dead reckoning system would have been known.

Burns presents a dead reckoning method to use GPS and a wheel tachometer to correct the position of a train, or other moving objects, on the track of a rail network. The method is to provide accurate information of the position of the train on a specific segment of the rail network without using the old method of trackside transponders.

The present invention differs from **Burns'** method in many aspects. First, in **Burns'** method, it is assumed that a base radio is on and connected all the time, so that he moving object (the train) can continue sending radio signals to the base antenna (col. 3, line 15). The radio **Burns** uses is for one-way communication, while the present invention requires two-way radio communications, namely in claim 1 a communication circuit to transmit and to receive messages within the network.

Second, **Burns'** method uses one single communication point, the only base radio, while the present invention requires multiple communication points that are changing all the time, such as the communications between two moving objects. **Burns'** method does not allow for a train to communicate with another train, unlike the present invention. While in the present invention one moving object may issue an instruction to cause another moving object to change its behavior, **Burns'** method provide no such capability because it only provides more accurate position to the base station.

In regard to claims 48 and 57, the Examiner incorporates his rejection in regard to claim 1 above. Further, the Examiner contended that **Burns** teaches using a dead reckoning system for detecting location information of the object in

real time. Further, the Examiner contended that using the dead reckoning system for detecting the location of the object without depending on the extent of the GPS coverage would have been well known. The Examiner contended that it would have been obvious to add the dead reckoning system of **Burns** to the system of **Monroe** in order to detect the position of the mobile object when GPS is not accessible.

Burns uses a combination of GPS and tachometer for dead reckoning. The dead reckoning method won't work if the tachometer does not function. The present invention does not require the functioning of tachometer for dead reckoning. This is because the present invention uses a combination of GPS and terrestrial location networks, in addition to gyro/speed sensors, for dead reckoning.

In regard to claims 49, 50, 54 - 56, and 61 - 63, the Examiner refers to his rejection of claims 2, 3, and 14 - 16 above.

The applicant similarly responds by incorporating the remarks made above in regard to Claims 2, 3, 5 and 14 - 16.

Claims 39 - 41, 45 - 47, 58 and 59 were rejected as being obvious over **Monroe** in view of **Pratt** and **Burns**. In regard to claims 39 - 41, 45 - 47, 58 and 59, the Examiner refers to his rejection of claims 4, 5, and 14 – 16 above.

The applicant similarly incorporates here the remarks made in regard to the corresponding claims above.

Claims 53 and 60 were rejected as being obvious over **Monro** in view of

Burns and **Rowson**. In regard to claims 53 and 60 the Examiner refers to his rejection of claim 13 above.

The applicant similarly incorporates here the remarks made in regard to the corresponding claims above.

The applicant respectfully requests advancement of the claims to issuance.

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 9, 2004. By Angela Williams Signature January 9, 2004

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Abstract of the Disclosure

A smart location information processor automatically detects the location of a moving object in real-time, using either a receiver from the satellites or from any terrestrial location detection network. The device processes the location information and activates responsive functions according to location and status. Messages are transmitted through one of multiple wireless communication networks to other units. At any time, the device may receive instructions wirelessly from other stationary or mobile objects. All the events of the installed moving object are stored in a history file which can be sent to a remote server and then cleared from the installed object, either regularly or instantaneously. The device in one object may automatically activate certain functions controlling the object in response to the location of another object installed with the same device.